# Complete Summary

## GUIDELINE TITLE

American Academy of Orthopaedic Surgeons (AAOS) clinical guideline on wrist pain - phase I.

## BIBLIOGRAPHIC SOURCE(S)

American Academy of Orthopaedic Surgeons (AAOS). AAOS clinical guideline on wrist pain - phase I. Rosemont (IL): American Academy of Orthopaedic Surgeons (AAOS); 2002. 15 p. [79 references]

## COMPLETE SUMMARY CONTENT



## SCOPE

### DISEASE/CONDITION(S)

Acute wrist pain of uncertain origin, not arising from trauma, infection, or neurological/vascular defect, due to the following conditions:

- Carpal tunnel syndrome
- Arthroses
- Tendonitis
- Ligamentous injury

### GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Treatment

### CLINICAL SPECIALTY

Emergency Medicine
Family Practice
Internal Medicine
Neurological Surgery
Neurology
Orthopedic Surgery
Physical Medicine and Rehabilitation
Rheumatology
Sports Medicine

## INTENDED USERS

Physicians

## GUIDELINE OBJECTIVE(S)

- To improve patient care by outlining the appropriate information gathering and decision-making processes involved in managing and diagnosing wrist pain
- To guide qualified physicians through a series of diagnostic and treatment decisions in an effort to improve the quality and efficiency of care

## TARGET POPULATION

Adults (skeletally mature individuals) with wrist pain

## INTERVENTIONS AND PRACTICES CONSIDERED

### Diagnosis

1. History, including review of:
    - Trauma
    - Pain, acute or insidious
    - Presence of mass
    - Abnormal clicks, pops, clunks, snaps with motion, or grinding sensations
    - Sensation of weakness
    - Presence of swelling at wrist or along tendons
    - Presence and distribution of numbness
    - When symptoms began and duration
2. Physical examination, including:
    - Deformity
    - Range of motion (ROM) in wrist, fingers, hand, and forearm
    - Swelling
    - Mass
    - Tenderness
    - Crepitus
    - Clicking, popping, or clunking with wrist motion
    - Strength testing
    - Sensation changes
    - Neurologic signs

- Circulatory status
- Warmth, redness
- Grip strength
- Muscular atrophy

3. Imaging, including:
    - Plain anterior-posterior, oblique, and lateral wrist x-rays, including hand when indicated
    - Rarely indicated imaging: magnetic resonance imaging (MRI), computed tomography (CT)

Treatment

1. Activity modification
2. Splinting of wrist
3. Nonsteroidal anti-inflammatory drugs (NSAIDs)
4. Steroid injection
5. Referral to musculoskeletal specialist if indicated

### MAJOR OUTCOMES CONSIDERED

Symptom control and/or resolution

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Literature Review: A search of MEDLINE was performed in order to update the literature used to develop the original guideline. English language journals were searched from 1988 to 2001; human studies of adults over 19 years of age were included.

### NUMBER OF SOURCE DOCUMENTS

Of the abstracts generated by the search, 79 articles were graded by the work group and included in the bibliography.

### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Type I. Meta-analysis of multiple, well-designed controlled studies; or high power randomized, controlled clinical trial

Type II. Well-designed experimental study; or low-power randomized, controlled clinical trial

Type III. Well-designed, nonexperimental studies, such as nonrandomized, controlled single-group, pre-post, cohort, time, or matched case-control series

Type IV. Well-designed, nonexperimental studies, such as comparative and correlational descriptive and case studies

Type V. Case reports and clinical examples

Consensus/opinion (as it is used in bibliography of the original guideline): Articles representing expert consensus and not meeting the rigid I-V measurement are noted to represent consensus/opinion.

## METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

## DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not applicable

## METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

## DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Consensus Development: The work group participated in a series of conference calls and meetings in which information from the literature search was extracted and incorporated into the original algorithm. Information from the literature was supplemented by the consensus opinion of the work group when necessary. Multiple iterations of the guideline were then completed and reviewed by work group members. Modifications (when supported by references from the literature) were then incorporated by the work group chairman.

## RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Strength of Recommendation

The strength of the guideline recommendations for or against an intervention was graded as follows:

A. Type I evidence or consistent findings from multiple studies of types II, III, or IV
B. Types II, III, or IV evidence and findings are generally consistent
C. Types II, III, or IV evidence, but findings are inconsistent
D. Little or no systematic empirical evidence

## COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

## METHOD OF GUIDELINE VALIDATION

Internal Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The revised guideline was reviewed and approved by various groups within the American Academy of Orthopaedic Surgeons, including the Evidence-Based Practice Committee, Council on Research and Scientific Affairs, and Board of Directors.

# RECOMMENDATIONS

## MAJOR RECOMMENDATIONS

Definitions for the ratings of the strength of recommendation (A-D) and the levels of evidence (Type I-Type V) are provided at the end of the "Major Recommendations" field.

### Differential Diagnosis

#### Tendonitis

Definition of the Problem

Tendonitis is a condition resulting from irritation of a tendon, usually in a region where the tendon passes through a tunnel. Pain and swelling develop over the localized area of tendon. Pain is worse with motion, especially motion that puts the involved tendon on stretch. A squeaking or rubbing and sometimes a triggering or catching sensation will be described by patients who have significant tenosynovitis. Tenosynovitis around the finger flexor tendons in the carpal tunnel region can have the associated symptoms of fingertip numbness from median nerve compression. Splinting, rest, anti-inflammatory agents, and local corticosteroid injection* will all lead to improvement. Tenosynovitis may result from inflammatory arthropathies such as rheumatoid arthritis or from gout. Tenosynovitis from amyloidosis is also common in renal dialysis patients. Adults who overuse their wrists with repeated motion may develop tendonitis.

Examination reveals localized pain, swelling, and tenderness. The pain will be worsened with certain motions, such as stretching the involved tendon, or with active work of the involved tendon, especially work against a resisting force. Crepitus and sometimes triggering can be palpated if a significant tenosynovitis has developed.

X-rays may be useful to rule out other potential causes of pain in the area in question, but they will not show a tendonitis. A magnetic resonance imaging (MRI) scan will show any significant tenosynovitis and tendon nodules that sometimes develop. However, the diagnosis can almost always be made clinically without the need for an MRI ("B" recommendation) (Alberton et al., 1999; Armstrong et al., 1987; Giovagnorio, Andreoli, & De Cicco, 1997; Glajchen & Schweitzer, 1996; Higgs & Young, 1996; Klug, 1995; Marini et al., 1994; Sueyoshi et al., 1996; Zenone et al., 1999).

Recommendations

Initial treatment consists of splinting to immobilize the involved tendon(s), nonsteroidal anti-inflammatory drugs (NSAIDs)**, and activity modifications to avoid painful motions and actions ("B" recommendation) (Alberton et al., 1999; Armstrong et al., 1987; Grundberg & Reagan, 1985; Higgs & Young, 1996; Klug, 1995; Moore, 1997; Teefey, Middleton, & Boyer, 2000; Thorson & Szabo, 1992; Wood & Linscheid, 1973). If pain and swelling are severe, or if the symptoms do not abate within four to six weeks, then a corticosteroid injection* can be used to relieve symptoms ("B" recommendation) (Alberton et al., 1999; Giovagnorio, Andreoli, & De Cicco, 1997; Grundberg & Reagan, 1985; Harvey, Harvey, & Horsley, 1990; Higgs & Young, 1996; Klug, 1995; McKenzie, 1972; Moore, 1997; Rankin & Rankin, 1998; Tan, Low, & Tan, 1994; Teefey, Middleton, & Boyer, 2000; Thorson & Szabo, 1992; Wood & Linscheid, 1973)

Patients who do not improve or those who have recurrence of symptoms should be referred to a specialist. Surgery is indicated for refractory cases.

Expected Clinical Results

Tendonitis resulting from overuse will usually respond to splinting, activity modification, NSAIDs**, and corticosteroid injection*. However, the symptoms frequently reoccur when activities are resumed and when the injection wears off in one to two months ("B" recommendation) (Alberton et al., 1999; Grundberg & Reagan, 1985; Harvey, Harvey, & Horsley, 1990; Higgs & Young, 1996; Moore, 1997; Rankin & Rankin, 1998; Tan, Low, & Tan, 1994; Thorson & Szabo, 1992; van Vugt, van Dalen, & Bijlsma, 1998). Tenosynovitis resulting from other causes will often respond only minimally to medical management and usually requires surgical tenosynovectomy to recover. Long-standing tenosynovitis increases the risk for tendon rupture. Surgical decompression of tendons and tenosynovectomy are generally very successful for relieving symptoms and for preventing future problems ("B" recommendation) (Alberton et al., 1999; Arons, 1987; Grundberg & Reagan, 1985; Harvey, Harvey, & Horsley, 1990; Higgs & Young, 1996; Klug, 1995; Rankin & Rankin, 1998; Tan, Low, & Tan, 1994; Thorson & Szabo, 1992; Zenone et al., 1999).

Alternative Approaches

Debilitated patients that cannot undergo surgery may be treated with serial corticosteroid injections*, long-term splinting, and permanent activity restriction. However, these patients will have a significant risk for tendon rupture and further functional impairment.

## Carpal Tunnel Syndrome

### Definition of the Problem

Carpal tunnel syndrome is a condition resulting from compression of the median nerve within the carpal tunnel. Symptoms may include numbness in the thumb, index, middle, and/or ring fingers. The numbness is usually intermittent and normally occurs more frequently during sleep or rest. There may be associated pain in the palmar hand, wrist, and forearm. If the carpal tunnel syndrome becomes severe, the patient may develop thenar atrophy, weakness, and persistent numbness with loss of texture discrimination. Carpal tunnel syndrome is much more common in women than in men. The incidence increases with patient age. The cause may be multifactorial or may be unknown.

Neurologic findings such as Phalen's and Tinel's signs may be present ("C" recommendation) (Borg & Lindblom, 1986; Harrington et al., 1998; Katz et al., 1990; Novak et al., 1992; Phalen, 1966). In severe cases, thenar atrophy with weakness of thumb opposition and loss of two-point and texture discrimination will become apparent. Nerve conduction studies will show delayed conduction of the median nerve across the wrist.

### Recommendations

Initial treatment usually consists of wrist splinting, NSAIDs**, and activity modifications ("B" recommendation) (Higgs & Young, 1996; Gelberman, Aronson, & Weisman, 1980; Harrington et al., 1998; Harter et al., 1993; Kruger et al., 1991). Therapy instruction for wrist exercises is sometimes beneficial. If the patient's work environment is in question, an ergonomic evaluation and modifications to reduce wrist motion in the work place can also decrease symptoms.

If, after four to six weeks, symptoms remain significantly bothersome, then referral to a specialist is indicated. Nerve conduction studies should be obtained to confirm the diagnosis. A corticosteroid injection into the carpal tunnel* can be helpful to alleviate symptoms, at least temporarily ("B" recommendation) (Higgs & Young, 1996; Gelberman, Aronson, & Weisman, 1980; Harter et al., 1993; Phalen, 1966)]. Persistent (rather than intermittent) numbness and thenar atrophy are signs of severe median nerve compression that may lead to permanent nerve damage. In these cases, referral to a specialist for surgical decompression should occur in a timely fashion.

### Expected Clinical Results

Most patients with carpal tunnel syndrome will initially respond favorably to splinting, NSAIDs**, activity modification, and corticosteroid injection* ("B" recommendation) (Higgs & Young, 1996; Gelberman, Aronson, & Weisman, 1980; Harrington et al., 1998; Harter et al., 1993; Phalen, 1966). However, symptoms almost always return, wax and wane, and eventually worsen and require surgical release. Severe cases with persistent numbness and/or thenar atrophy rarely respond to nonoperative management and have the potential for developing permanent nerve damage. The majority of patients will improve

significantly with surgery ("B" recommendation) (Higgs & Young, 1996; Harter et al., 1993; Phalen, 1966).

### Alternative Approaches

For patients too debilitated to undergo surgery, and for carpal tunnel syndrome (CTS) of pregnancy, prolonged splinting and serial corticosteroid injections are helpful*.

## Ligamentous Injury

### Definition of the Problem

Ligament injuries represent conditions in which damage to ligaments leads to their incompetence. Patients may present with acute pain following an injury, or chronic symptoms from an injury in the past. Besides pain with activity, symptoms of ligamentous incompetence may include joint swelling, stiffness, weakness, and mechanical symptoms such as giving way, catching sensations, and popping. Long-standing joint instability may lead to the development of arthrosis. Ligament injuries occur in adults and can result from trauma such as a fall on an outstretched hand or a twisting force. In the skeletally immature, ligament injuries are rare.

Physical examination may demonstrate swelling, weakened grip, visible or palpable shifting of carpal bones, clunks or pops under stress, and limited range of motion.

X-rays may show an abnormally widened space between two carpal bones, most commonly the scaphoid and lunate. The scaphoid and/or lunate may show abnormal angulation. In some patients, routine x-rays will be normal and either x-rays under stress, arthrograms, or fluoroscopy are needed to demonstrate the instability ("A" recommendation) (Brahme & Resnick, 1991; Braunstein et al., 1986; Brown & Lichtman, 1984; Cantor et al., 1994; Chidgey, 1992; Dalinka et al., 1983; Hodgson, Royle, & Stanley, 1995; Johnstone et al., 1997; Ko & Viegas, 1997; Kuschner & Lane, 1997; Linn, Mann, & Gilula, 1990; Manaster, Mann, & Rubenstein, 1989; Mrose & Rosenthal, 1991; Nakamura et al., 1997; Oneson et al., 1996; Palmer, Levinsohn, & Kuzma, 1983; Raskin & Beldner, 1998; Richmond et al., 1998; Roth & Haddad, 1986; Schweitzer et al., 1992; Weiss, Akelman, & Lambiase, 1996; Yin et al., "Surgeons' decision making," 1996; Young & Higgs, 1996; Potter et al., 1997; Yin et al., "Evaluation," 1996; Zlatkin et al., 1989). Some ligament tears can be demonstrated by an MRI scan, but the scanner does not always define the pathology. Post-traumatic arthrosis develops in chronic cases, and x-rays will show subchondral sclerosis, osteophytes, and joint space narrowing.

### Recommendations

X-rays should be taken to aid in diagnosis, rule out fracture, and in chronic cases to determine the extent of post-traumatic arthrosis. Splinting, NSAIDs**, activity modification, and intra-articular corticosteroid injection* can all help to reduce the symptoms in chronic cases. Therapy is indicated to increase strength and employ

a mechanical advantage with activities requiring force ("B" recommendation) (Chidgey, 1992; Kuschner & Lane, 1997; Nakamura et al., 1997; Apergis, 1996).

For suspected acute ligament tears, and for chronic tears not responsive to medical management, referral to a specialist should be made. Surgical treatment is usually necessary for acute ligament tears and for chronic tears with persistent, significant symptoms ("B" recommendation) (Koman et al., 1990; Weiss, Akelman, & Lambiase, 1996; Apergis, 1996; Ashmead et al., 1994; Augsburger et al., 1992; Hastings & Silver, 1984; Pisano & Peimer, 1991; Tomaino, Delsignore, & Burton, 1994; Viegas, 1994; Watson, Goodman, & Johnson, 1981).

### Expected Clinical Results

Chronic ligament tears will often show partial response to splinting, activity modification, and therapy for strengthening. However, post-traumatic arthrosis eventually develops and worsens with time. In these patients, surgical treatment consisting of arthrodesis or arthroplasty would be expected to relieve pain ("B" recommendation) (Ashmead et al., 1994; Augsburger et al., 1992; Hastings & Silver, 1984; Pisano & Peimer, 1991; Tomaino, Delsignore, & Burton, 1994; Viegas, 1994; Watson, Goodman, & Johnson, 1981). Acute ligament tears will improve some over several months with decreased pain and swelling but without surgical repair will have continued problems with activity-related pain, swelling, weakness, and mechanical symptoms such as giving way or joint popping. Surgical repair will usually decrease pain, swelling, and mechanical symptoms. Whether surgical treatment is rendered, or not, most patients will have some permanent loss of wrist motion ("B" recommendation)(Ashmead et al., 1994; Augsburger et al., 1992; Hastings & Silver, 1984; Pisano & Peimer, 1991; Tomaino, Delsignore, & Burton, 1994; Viegas, 1994; Watson, Goodman, & Johnson, 1981).

### Alternative Approaches

Patients who are unwilling or unable to have surgery because of a severe medical condition can be treated with long-term splinting and analgesics.

## Arthrosis

### Definition of the Problem

Arthroses represent pathological conditions of the joint itself with destruction of the articular cartilage. The wrist is a common site for the development of arthrosis. Pain and loss of motion worsen over time. Pain is worsened by activity and movement. Symptoms are usually lessened with splinting and NSAIDs**. Osteoarthritis is more common after age 50, but arthroses resulting from other causes may occur at much younger ages. The multiple possible causes of wrist arthroses include trauma, osteoarthritis, inflammatory arthritis, gout, and sepsis.

Examination reveals diminished range of motion, pain and crepitus with motion, weakness, and diffuse swelling and tenderness around the joint.

X-rays may show joint space narrowing, periarticular cysts and erosions, osteophytes, and subchondral sclerosis.

Recommendations

X-rays should be taken to confirm the diagnosis and determine the severity of the arthrosis. Initial treatment consists of activity modification to reduce aggravating factors, NSAIDs**, and splinting of the wrist ("B" recommendation) (Docken, 1987; Patterson, 1975; Sarkin, 1975; Stolzer et al., 1962). Intra-articular injection of corticosteroids* will usually alleviate pain for several weeks ("B" strong recommendation) (Docken, 1987; Sarkin, 1975; Stolzer et al., 1962).

If symptoms persist and are significantly bothersome, then referral should be made to a specialist. Surgical treatment may be indicated when pain warrants.

Expected Clinical Results

Splinting, NSAIDs**, and intra-articular corticosteroid injections* are all expected to aid in reduction of pain and swelling. For patients with severe arthroses, medical management may not be helpful. In these severe cases, surgical treatment including joint arthroplasty or arthrodesis will generally alleviate the pain ("A" recommendation) (Docken, 1987; Sarkin, 1975).

Alternative Approaches

Prolonged immobilization may lead to permanent joint stiffness and is thus usually avoided. However, patients refusing surgery, or those who are too debilitated to undergo surgery, can have significant pain reduction with long-term splinting. Serial intra-articular corticosteroid injections* and analgesic medications will also help relieve pain in these patients.

*Corticosteroid injection may temporarily elevate blood glucose and blood pressure in some patients.

**NSAIDs are relatively contraindicated in patients with renal insufficiency or pregnancy. Administer cautiously in patients with hypertension or gastrointestinal intolerance. Side effects and toxicity should be monitored during administration.

Definitions:

Type of Evidence

Type I. Meta-analysis of multiple, well-designed controlled studies; or high-power randomized, controlled clinical trial

Type II. Well-designed experimental study; or low-power randomized, controlled clinical trial

Type III. Well-designed, nonexperimental studies such as nonrandomized, controlled single-group, pre-post, cohort, time, or matched case-control series

Type IV. Well-designed, nonexperimental studies, such as comparative and correlational descriptive and case studies

Type V. Case reports and clinical examples

Strength of Recommendations

A. Type I evidence or consistent findings from multiple studies of types II, III, or IV
B. Types II, III, or IV evidence and findings are generally consistent
C. Types II, III, or IV evidence, but findings are inconsistent
D. Little or no systematic empirical evidence

### CLINICAL ALGORITHM(S)

An algorithm is provided in the original guideline for Universe of Adult Patients with Wrist Pain--Phase I.

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is specifically stated and identified for each recommendation (see the "Major Recommendations" field).

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

Improved care of patients with wrist pain

### POTENTIAL HARMS

- Nonsteroidal anti-inflammatory drugs (NSAIDs) may produce side effects and are not tolerated in all individuals.
- Corticosteroid injection may elevate blood glucose and blood pressure in some patients.

## CONTRAINDICATIONS

### CONTRAINDICATIONS

Nonsteroidal anti-inflammatory drugs (NSAIDs) are relatively contraindicated in patients with renal insufficiency or pregnancy. Administer cautiously in individuals with hypertension or gastrointestinal intolerance.

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

- This guideline should not be construed as including all proper methods of care or excluding methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding any specific procedure or treatment must be made by the treating physician after a full assessment of all circumstances presented by a patient, including the needs and resources of a particular locality or institution.
- This guideline does not address all possible conditions associated with wrist pain, only those that account for the majority of initial visits to a physician.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

### IMPLEMENTATION TOOLS

Clinical Algorithm

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Getting Better
Living with Illness

### IOM DOMAIN

Effectiveness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

American Academy of Orthopaedic Surgeons (AAOS). AAOS clinical guideline on wrist pain - phase I. Rosemont (IL): American Academy of Orthopaedic Surgeons (AAOS); 2002. 15 p. [79 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

## DATE RELEASED

1996 (revised 2002)

## GUIDELINE DEVELOPER(S)

American Academy of Orthopaedic Surgeons - Medical Specialty Society
American Association of Neurological Surgeons - Medical Specialty Society
American College of Physical Medicine and Rehabilitation - Professional Association
American College of Rheumatology - Medical Specialty Society

## SOURCE(S) OF FUNDING

American Academy of Orthopaedic Surgeons

## GUIDELINE COMMITTEE

American Academy of Orthopaedic Surgeons Task Force on Clinical Algorithms

## COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Revision panel: Victoria Masear, MD, Chair; Morton Kasdan, MD; William LaSalle, MD; Carolyn Kerrigan, MD; B. Kent Maupin, MD

Original panel: Richard Berger, MD, Chair; William Cooney, MD; Barry Simmons, MD; William Engber, MD; A. Lee Osterman, MD; Robert M. Szabo, MD; Edward C. McElfresh, MD; William B. Kleinman, MD

## FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

## GUIDELINE STATUS

This is the original release of this guideline.

This guideline updates a previous version: American Academy of Orthopaedic Surgeons. Clinical guideline on wrist pain. Rosemont (IL): American Academy of Orthopaedic Surgeons; 1999. 6 p.

## GUIDELINE AVAILABILITY

Electronic copies: Available from the American Academy of Orthopaedic Surgeons Web site.

Print copies: Available from the American Academy of Orthopaedic Surgeons, 6300 North River Road, Rosemont, IL 60018-4262. Telephone: (800) 626-6726 (800 346-AAOS); Fax: (847) 823-8125; Web site: www.aaos.org.

## AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Universe of adult patients with wrist pain -- Phase I. Rosemont (IL): American Academy of Orthopaedic Surgeons; 2002. 3 p.

Electronic copies: Available in Portable Document Format (PDF) from the American Academy of Orthopaedic Surgeons Web site.

Print copies: Available from the American Academy of Orthopaedic Surgeons, 6300 North River Road, Rosemont, IL 60018-4262. Telephone: (847) 823-7186; (800) 346-AAOS. Fax: (847) 823-8125. Web site: www.aaos.org.

## PATIENT RESOURCES

None available

## NGC STATUS

This summary was completed by ECRI on March 15, 2000. The information was verified by the guideline developer on July 11, 2000. This NGC summary was updated by ECRI on August 10, 2004. The information was verified by the guideline developer on September 1, 2004.

## COPYRIGHT STATEMENT

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Date Modified: 12/20/2004